CSOC-GSFC-REP-001346
Original

**Consolidated Space Operations Contract**

# Network Control Center Data System (NCCDS) Release M00.1 System Test Test Report

**Original**

**Issue Date: June 16, 2000**

**Effective: June 16, 2000**

**Contract Number: NAS9-98100**

# Consolidated Space Operations Contract
# Network Control Center
# Data System (NCCDS)
# Release M00.1
# System Test
# Test Report

**Issue Date: June 16, 2000**

**Effective: June 16, 2000**

**Contract Number: NAS9-98100**

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| B-1 through B-6 | Original |
| AB-1 through AB-5/AB-6 | Original |

| Document History | | | |
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| **Document Number** | **Status/Issue** | **Publication Date** | **Effective Date** |
| CSOC-GSFC-REP-001346 | Original | June 16, 2000 | June 16, 2000 |

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# Preface

This document, the Network Control Center Data System (NCCDS) Release M00.1 System Test Test Report provides the technical approach for system testing Release M00.1. M00.1 is a maintenance release consisting of the implementation of Problem Reports (PRs) written against the NCC98 Initial Release and the SPSR 99.1 Completion Release.

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# Section 1. Introduction

## 1.1 Purpose and Scope

This document, the *Network Control Center Data System (NCCDS) Release M00.1 System Test Test Report*, describes the testing materials and procedures that were used to verify that the software delivered with Release M00.1 fulfilled its allocated requirements and system level functionality. This document was prepared to report the results of the M00.1 system testing phase, including functional testing and regression testing.

The scope of the document includes information regarding the system capabilities and configuration, the test schedule, and the test results.

## 1.2 Applicable Documents

The following documents were either referenced during the preparation of this report, or were applicable to the testing of Release M00.1.

a. Network Control Center Data System, (NCCDS) Release M00.1 System Test Test Plan, CSOC-GSFC-TEST-000520, October 1999.

b. Network Control Center Data System (NCCDS) System Requirements, 1998, 541-SRD-NCCDS/1998, Revision 2, May 1999.

c. Interface Control Document between the Network Control Center Data System and the Mission Operations Centers, 451-ICD-NCCDS/MOC, Revision 1, June 1999.

d. Interface Control Document Between the Network Control Center Data System and the Nascom Control and Status System, 530-ICD-NCCDS/NASCOM, Revision 2, December 1995.

e. Interface Control Document between the Network Control Center Data System and the Sensor Data Processing Facility, 530-ICD-NCCDS/SDPF, Revision 2, December 1995.

f. Interface Control Document (ICD) between the Network Control Center (NCC)/Flight Dynamics Facility (FDF) and the White Sands Complex (WSC), 530-ICD-NCC-FDF/WSC, Revision 5, June 1997.

g. SPSR User's Guide (Online), continuous updates.

h. CCS User's Guide (Online), January 1999.

i. NPG User's Guide, January 1999.

j. Network Control Center (NCC) Central Delogger (NCD) User's Manual, Release 98.1, January 1999.

k. Network Control Center (NCC) Test System (NTS) User's Manual, Release 98.1, February 1998.

l. Firewall User's Guide, Release 98.1, Revision 3, December 1998.

m. UIFCs and Data Rates white paper, September 25, 1998.

n. Service Level Flexibilities white paper.

o. Release M00.1 System Test Completion Notification, February 10, 2000.

## 1.3 Assumptions

This test report assumes that the reader has a basic understanding of the NCCDS configuration for Release M00.1 and the NCC operational capabilities. Standard terminology as applied to the NCC by NASA is used whenever possible.

# Section 2. System Testing

## 2.1 Overview

M00.1 was a maintenance release consisting of the implementation of Problem Reports (PRs) written against the NCC98 Initial Release and the SPSR 99.1 Completion Release. It was the first of 3 planned maintenance releases for the NCCDS.

## 2.2 Functional Testing

The objective of System Test Functional Testing was to verify that the PRs implemented in M00.1 had been resolved and to document any new problems discovered while testing these fixes. The contents of this release are spelled out in the NCCDS Release M00.1 Contents Letter, delivered October 6, 1999. There were additions made to these contents and a contents letter addendum was delivered on November 2, 1999. This addendum contained a NCC Change Request (NCR) to be delivered with the release. System Test was responsible for testing all of the delivered contents plus PRs that were resolved during the previous release and were rolled up or merged into the M00.1 baseline. System Test was also responsible for verifying fixes to PRs that were discovered and resolved during M00.1 testing. Test objectives and detailed test procedures were developed for each functional test item listed in Table 2-1. The test procedures will be delivered to the NCC 98 web page.

***Table 2-1. Functional Test Items***

| Test Item | Test Item Title |
|---|---|
| MR1-1.02 | Remove Add and Delete Buttons for MDM and HDRM |
| MR1-1.03 | Batch Schedule Error Checking |
| MR1-1.04 | Saving Changes To Return SSC Windows |
| MR1-1.05 | Request ID/Event ID is Displayed Correctly |
| MR1-1.06 | Validate Tracking SSCs Correctly |
| MR1-1.07 | Use Labels in Filter that are Consistent with Window |
| MR1-1.08 | Cannot Add a Return Channel when Editing a SAR |
| MR1-1.09 | Active Schedule - Impact Indicators |
| MR1-1.10 | Service Parameter Records Use Default Buttons |
| MR1-1.11 | Deleting All Db Records for a Deleted SSC |
| MR1-1.12 | Cannot Delete Destinatons from the Database During Transmissions |
| MR1-1.13 | VTRS and STRS Windows Display Time of Next Execution |
| MR1-1.14 | Remove Appropriate Edit Control Information |

| Test Item | Test Item Title |
|---|---|
| MR1-1.15 | SMA Cross Support Forward Link |
| MR1-1.16 | Dialog Box Appears when DbConsistency Error Occurs |
| MR1-1.17 | VTRS Offset and Review Values Always Saved in Database |
| MR1-1.18 | Waitlisted Requests Cannot be Edited |
| MR1-1.19 | AltSAR and Replace Request Priority |
| MR1-1.21 | Multiple Events for the Same Request |
| MR1-1.22 | Batch Schedule Process Request Event Filter |
| MR1-1.23 | Memory Leak and Roguewave Bug |
| MR1-1.24 | Request ID/Event ID is Displayed Correctly in Wait List Window |
| MR1-1.25 | Saving Replace Requests Without Changing The Window |
| MR1-1.26 | Various GUI Layouts |
| MR1-1.27 | Schedule Analysis Statistics |
| MR1-1.28 | Separate Windows for Forward and Return EET SSCs |
| MR1-1.29 | Deleting GTs, SGLTs, and TDRSs |
| MR1-1.30 | Relative and Absolute Boundary Buttons |
| MR1-1.31 | Events Sorted by Start Time in Schedule Editor |
| MR1-1.32 | Incorrect Batch Schedule Status |
| MR1-1.33 | Scheduling Windows |
| MR1-1.34 | Reprocessing and the Request Pool Window |
| MR1-1.35 | Automatic Importing of Primary Chain Members |
| MR1-1.36 | Request Pool Filter |
| MR1-2.01 | Changes to Declined Requests when Referenced by a Replace Request |
| MR1-2.02 | TDRS Unscheduled Time (TUT) - MAR |
| MR1-2.03 | Batch Requests Expire when Batch Boundary is in the Past |
| MR1-2.04 | Multiple Primary Versions of a Request |
| MR1-2.05 | Obsolete Lock-Outs |
| MR1-2.06 | Guard Locks |
| MR1-2.07 | Delete Secondaries when Original is Waitlisted |
| MR1-2.08 | Declined Explanation String Length |
| MR1-2.09 | Deleting Secondary Versions of Declined Baseline Requests |
| MR1-2.10 | Gap in EET Event |
| MR1-2.11 | Secondary Alternate SARs with Incorrect Explanation |
| MR1-2.12 | Fixed TUT When Flexibility is Used |

| Test Item | Test Item Title |
|---|---|
| MR1-2.13 | Activeschedulebroker Hangs After Oracle Error #2201 |
| MR1-2.14 | Displaying Minus Duration Tolerance for a Baseline Customer |
| MR1-2.15 | Requests with Tracking Services and Flexibility |
| MR1-2.16 | EET Events Supported after TDRS Mapping Change |
| MR1-2.17 | SRM Reporting for MA and SA Resource Limitations |
| MR1-2.18 | Minimum Bandwidth is Allocated |
| MR1-2.19 | Multiple TSW Updates Received 10 to 15 Milliseconds Apart |
| MR1-2.20 | Process Playback Events in Batch Schedules |
| MR1-2.21 | Batch Schedule Activation Audit for Omitted Requests |
| MR1-2.22 | Removal of Deleted Events from Active Schedule Window |
| MR1-3.01 | ShoStatusMonitor Signal Handling |
| MR1-3.02 | Performing Request Validation at Request Save |
| MR1-3.03 | SRM Reporting Upon Database Exceptions |
| MR1-3.04 | CSN/SBSN Usage in Tracking Services is Not Constrained to Link References |
| MR1-4.01 | Transmission Segmentation |
| MR1-4.02 | Service Connection Semaphore Deadlock |
| MR1-4.03 | Video UIFC is Included in 90/01 Message |
| MR1-4.04 | Effects of TDRS Mappings on Schedule Transmissions |
| MR1-5.01 | Transfer Maximum Number of Static Data Records to CCS |
| MR1-5.02 | Display of TDRS ID on ODM Windows |
| MR1-5.03 | Removal of Expired Events from CCS |
| MR1-5.04 | Increase Number of Spacecraft Transferrable to CCS |
| MR1-5.05 | Amount of Time Between GCMR and OPM |
| MR1-5.06 | Validate K-Band Subtype for Acq-Fail Messages |
| MR1-5.07 | Selection of Primary and Secondary Vectors |
| MR1-5.08 | Ongoing Events Restarted After CCS Cold Start |
| MR1-6.01 | Backup and Deletion of Log Files |

Test items MR1-1.01 and MR1-1.20 were removed from the original list of planned test items based on the modifications to the contents delivered in M00.1. Conversely, test items MR1-1.31 through MR1-1.36, MR1-2.21, MR1-2.22, and MR1-4.04 were added to the original list of test items to cover new contents that were delivered.

The scheduled start date for System Test was October 4, however M00.1 was delivered and testing began on October 15. The decision to slip the start date was based on discussions at the System Test Readiness Review.

Functional tests were run with system times set ahead in 2000 in order to revalidate Year 2000 compliance.

It became apparent that system testing could not be completed in the scheduled time frame and the functional testing end date was extended 2 weeks to December 31. All functional tests were completed by this time and regression testing was ready to begin.

## 2.3 Regression Testing

Regression testing began in January 2000. XRunner, an automated test tool, was used to help conduct the regression tests. The objective of regression testing was to verify that the NCC 98 Initial Release and SPSR 99.1 Completion Release capabilities functioned the same in M00.1 as they did in the previous release. Forty outlines and automated test scripts were previously written to accomplish this. Eight more test outlines were written to cover the additional functionality's that were introduced in the SPSR 99.1 Completion Release. There was not enough time to create Xrunner scripts for these outlines, nor did time permit to update existing scripts. Most regression tests had to be tested manually. The specific test items are listed in table 2-2.

The regression test results from SPSR 99.1 were used as the baseline for comparison against the results from regression testing M00.1. Because functional testing was extended, regression testing had to be extended in order to have adequate time to complete all the tests. System Test completed all testing on January 21.

***Table 2-2. Regression Test Items***

| Test Item | Test Item Title |
|---|---|
| AT001 | Receipt of Acquisition Data |
| AT002 | Editing of Acquisition Data |
| AT003 | Transmission of Acquisition Data |
| DB001 | SN Database - TDRS ID, Names, GT/SGLT sets, mappings |
| DB002 | SN Database - Resource Availability |
| DB003 | SN Database - MDM/HDRM |
| DB004 | SN Database - TDRS Sets |
| DB005 | Customer Database - General |
| DB006 | Customer Database - SSCs |
| DB007 | Schedule Control Database - Scheduling Priorities |
| DB008 | Schedule Control Database - Sched Boundaries, Alerts, SA Slew Time |
| DB009 | Schedule Control Database - Data Retention |

| Test Item | Test Item Title |
|---|---|
| DB010* | Database Purging |
| EM001 | SSAF - SSAR Reconfigurations |
| EM002 | KuSAF - KuSAR Reconfigurations |
| EM003 | KaSAF - KaSAR Reconfigurations |
| EM004 | SMAF - SMAR Reconfigurations |
| EM005 | MAF - MAR Reconfigurations |
| NCD001 | NCD |
| NM001 | User Performance Data |
| NM002 | NM OPMs |
| SM001 | Initial Activation Mode Schedule Transmission |
| SM002 | Manual Mode Schedule Transmission |
| SM003 | Semi-Automatic Mode Schedule Transmission |
| SM004 | STRS Options |
| SM005 | Schedule Message Formats |
| SP001 | Invalid Replace Requests |
| SP002 | Valid Replace Requests |
| SP003 | Delete Requests |
| SP004* | Scheduling from Wait List - Automatic Mode |
| SP005* | Scheduling from Wait List - Semiautomatic Mode |
| SP006* | Alternate SARs / Chains |
| SR001 | SA/MA/SMA Scheduling Rules |
| SR002 | EET Scheduling Rules |
| SR003 | Tracking Scheduling Rules |
| SR004 | Minimum Gap Scheduling Rules |
| SR005 | TDRS Availability Scheduling Rules |
| SR006 | SGLT Availability Scheduling Rules |
| SR007 | UIFC Scheduling Rules |
| SR008 | MDM/HDRM Bandwidth Scheduling Rules |
| SR009 | Maximum Composition Data Rate Scheduling Rules |
| SR010* | Service Level Flexibility - Service Tolerances |
| SR011* | Service Level Flexibility - Event Tolerances |
| SR012* | TDRS Flexibility - TDRS Selection |
| SR013* | TSWs |

| Test Item | Test Item Title |
|---|---|
| TUT001 | TUT--SA |
| TUT002 | TUT-- MAF/SMAF |
| TUT003 | TUT--MAR/SMAR |
| Total | 48 |

Those test items marked with an asterisk were the 8 additional test items that covered the SPSR 99.1 functionality.

## 2.4 Test Schedule

The following figure diagrams the actual schedule of Release M00.1 System Test activities:

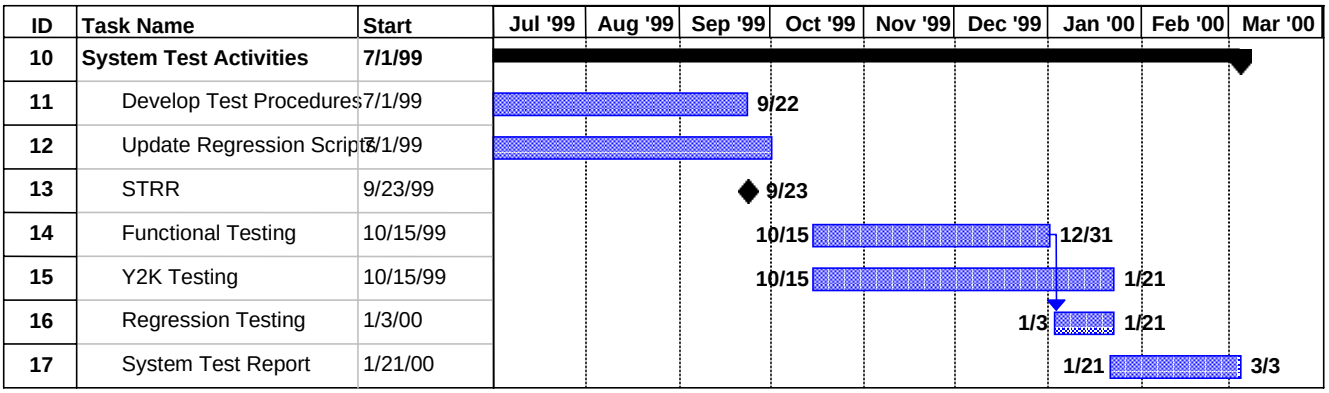


***Figure 2-1. System Test Activities Schedule***

The completion of system testing is documented in the *NCCDS Release M00.1 System Test Completion Notification*, dated February 10, 2000.

## 2.5 Test Environment and Configurations

Test execution was performed at the Test & Training facility (T&T) in Building 13 at GSFC. The test berth supported the full complement of components. It contained a 2-node clustered environment similar to but not the same as the operational environment. The Release M00.1 system test software configuration is diagramed in Appendix A of this document.

## 2.6 Archiving of Results

The test record process was the same for System Testing of Release M00.1 as it was for previous NCCDS releases. The test records were archived and will be used for future analysis, as comparison data for regression testing, and for reference during the planning and testing phases of subsequent releases.

## 2.7 Final Status Summary

### 2.7.1 Test Item Summary

The final status of each individual system test item, including test priority, actual start and completion dates, pass/fail status, and problem reports written, can be found in Appendix B. During system testing, 73 test items were started, 70 passed, and 3 were waived. The waived test items were a result of related PRs that were not resolved, but were accepted for conversion. Except for the steps in the 3 test items related to the converted PRs, all other test steps were completed and passed. The following table provides the breakdown of M00.1 test items.

***Table 2-3. Release M00.1 Test Status***

| Priority | Total | # Started | # Passed | # Waived |
|---|---|---|---|---|
| Functional | 73 | 73 | 70 | 3 |
| Regression | 48 | 48 | 48 | 0 |
| Total | 121 | 121 | 118 | 3 |

System Test functional testing of Release M00.1 experienced an average productivity level of 1.4 test items per tester per week. With regression testing included, the average productivity level jumps to 2.04. The productivity level for SPSR Release 99.1 averaged 0.43. The reason for such an increase in productivity between releases is that SPSR Release 99.1 was testing new functionality. Release M00.1 consisted of fixes to existing functionality. However, some of the changes made in M00.1 were quite substantial, such as the NCR included in the addendum to the contents.

The following charts depict the system test productivity and progress during Release M00.1 system testing:

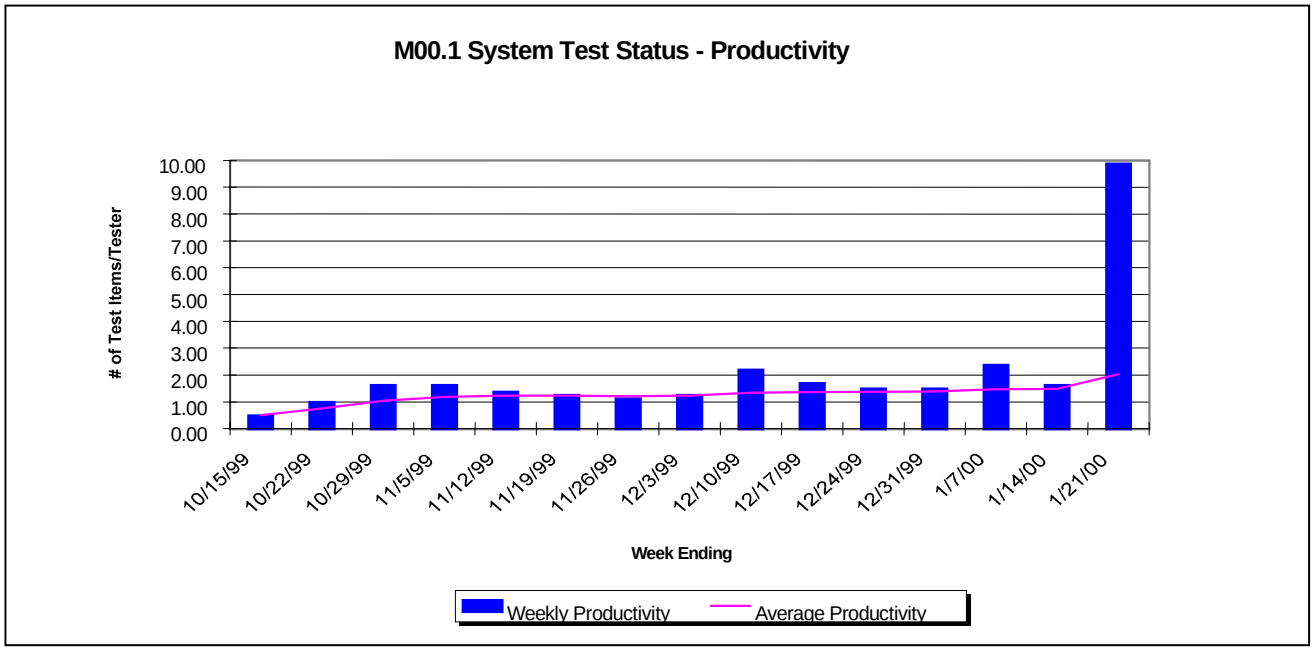


***Figure 2-2 System Test Productivity***

### 2.7.2 Problem Report Status

The following table provides the total number of PRs written per segment and per priority during the system testing phase of Release M00.1:

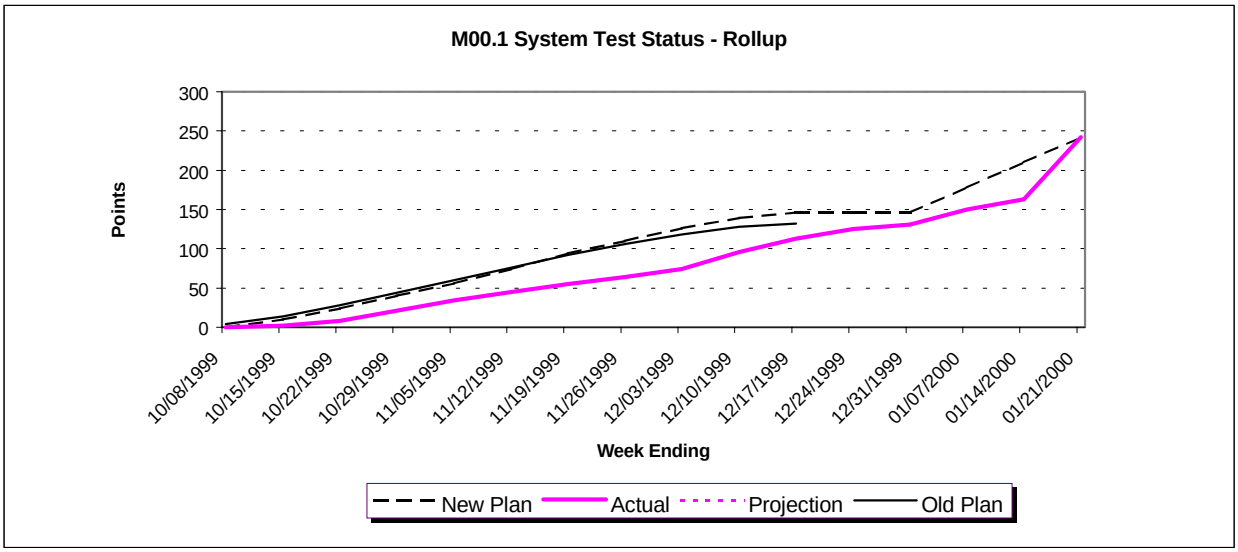


***Figure 2-3. System Test Progress – Rollup***

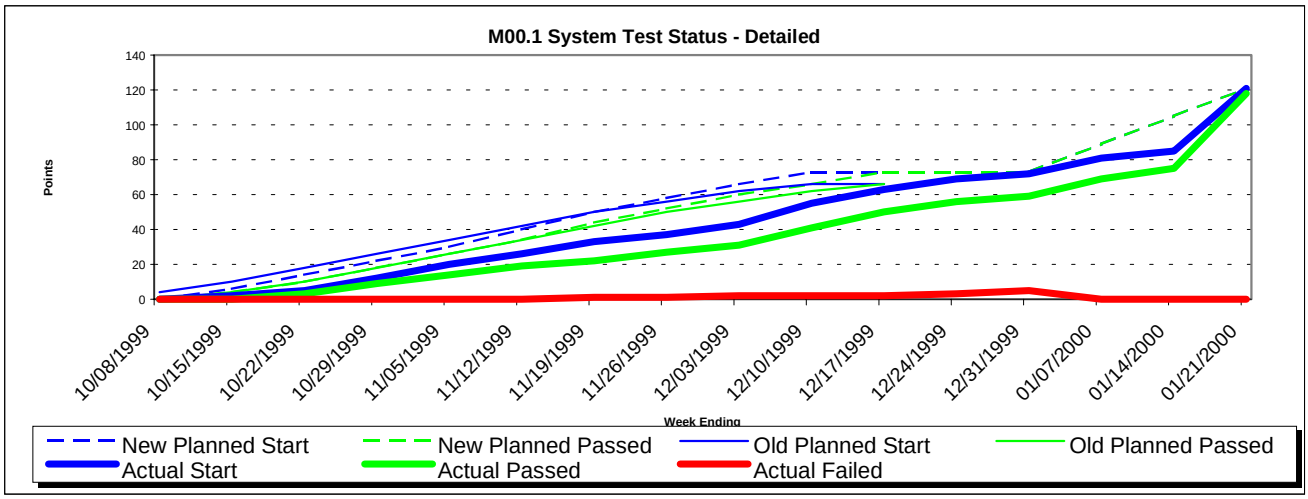


***Figure 2-4. System Test Process – Detailed***

***Table 2-4. Release M00.1 System Test Problem Reports***

| Segment | Priority 2 | Priority 3 | Priority 4 | Total |
|---|---|---|---|---|
| SPSR | 4 | 33 | 41 | 78 |
| CCS | 3 | 5 | 3 | 11 |
| SysAdmin | 1 | 0 | 0 | 1 |
| Total | 8 | 38 | 44 | 90 |

## 2.8 Lessons Learned

### 2.8.1 Assessments

The following are Release M00.1 assessments for the system testing phase:

a. XRunner experienced problems recognizing GUI Map files, windows, and objects (buttons, fields, etc.). This is believed to be due to GUI changes delivered in M00.1.

b. As a result of a previous lessons learned, to improve the process of checking out new patches when first delivered, the Patch Checkout was automated in Xrunner, but because of GUI changes it never ran successfully in M00.1 and time did not exist to correct the script. Patch Checkout was performed manually instead.

c. After some of the patch deliveries, windows could not be opened, log files could not be accessed, and TUT did not update on the workstations.

d. On some occasions testers did not always know how to perform certain functions such as modifying the NPG configuration files, performing a database purge, or modifying the database.

e. Because of the newly clustered environment, sometimes equipment, such as NPG, was not configured correctly, therefore unnecessary time was spent analyzing what happened to particular messages.

f. It was determined that certification of a completed test should be performed as early as possible to allow deficiencies to be corrected in a timely manner.

g. As a result of previous lessons learned, SSCs that are designated for particular tests such as regression tests, were marked as such and NTS files were saved with test data to speed up the regression testing phase.

h. During PR verification, it was sometimes difficult to reproduce the scenario that caused the PR. Development had to be referred to on several occasions.

i. As a result of previous lessons learned, the PC in the test berth was connected to our local LAN. This allowed testers to access their test records from GSFC.

j. Content added after the System Test Readiness Review put additional stress on the system testing schedule because test items needed to be written to cover the new contents.

k. System Test had trouble finishing procedure writing before testing began. In order to try to make up schedule time, several process improvements were tried. Instead of everyone reviewing each procedure, 1 or 2 testers with the most knowledge of the topic reviewed the procedure. The Release Leader also reviewed some procedures. Testers kept steps in the procedures brief (i.e. extra detail was assumed).

l. To much time was spent traveling between the testers office and the testing suite.

### 2.8.2 Recommendations

Based on the system testing of Release M00.1, it is recommended that System Test:

a. To resolve the problems with the GUI Map files not being recognized by XRunner, the following should be implemented:

   1. After the delivery of every patch compare GUI Map files to windows using tools such as the GUI Spy.

   2. Have all objects within the same window defined in the same GUI Map file.

   3. Have all windows within the same subsystem, for example, Space Network Database, defined within the same GUI Map file.

   4. Whenever possible, try not to use XRunner functions such as *get_text* that are not as flexible and are more likely to be affected by font changes.

   5. Have a standard naming convention for XRunner scripts.

b. For similar efforts in the future, implementing the above suggestions should improve the Patch Checkout process.

c. System Administrators made sure that windows could be opened and files could be accessed after a delivery. If no immediate help is available, System Test should write problems reports to document such occurrences. Documenting the problems will capture the information needed to improve the processes of delivering future patches.

d. Create a notebook or checklist of nominal settings for things such as the NPG configuration, normal TDRS Operational Names and Mappings, SAR Start Time or Freeze Intervals, list of baseline and full support customers, and others. Make sure that this book is kept up to date when configurations change.

e. Update our “How-to” procedure book to contain all necessary procedures and replace or eliminate obsolete procedures.

f. Continue to certify test items as early as possible. Look for new ways to improve the process.

g. Continue to use the method of SSC assignments per tester as established in previous releases. Remember to abide by the following:

h. SSCs used in regression tests should be well documented and copies kept in case of accidental modification so that the original values can be restored.

i. Make a comment in the description field of the SSC to identify it as a regression test SSC.

j. The author of the PR should describe the exact testing scenario that resulted in the problem report. That scenario should include specific times and data used. If development wrote the PR, testers should consult them to find out their intent before testing the PR.

k. Continue to access material from the LAN. Remember to forward important emails to the test berth too. That way urgent material gets viewed right away.

l. If new contents are added to a release, determine the priority of the contents, if they are low priority, possibly a procedure will not need to be written.

m. Continue to look for process improvements to aid in the procedure writing phase.

n. If the PC in the test berth had Lotus Notes installed on it, then testers could save a lot of time traveling between facilities to access mail. It would also serve useful for sending status information right from the test berth.

# Appendix A. Release M00.1 System Test Configuration

The following Figure A-1 diagrams the system test software configuration for Release M00.1.

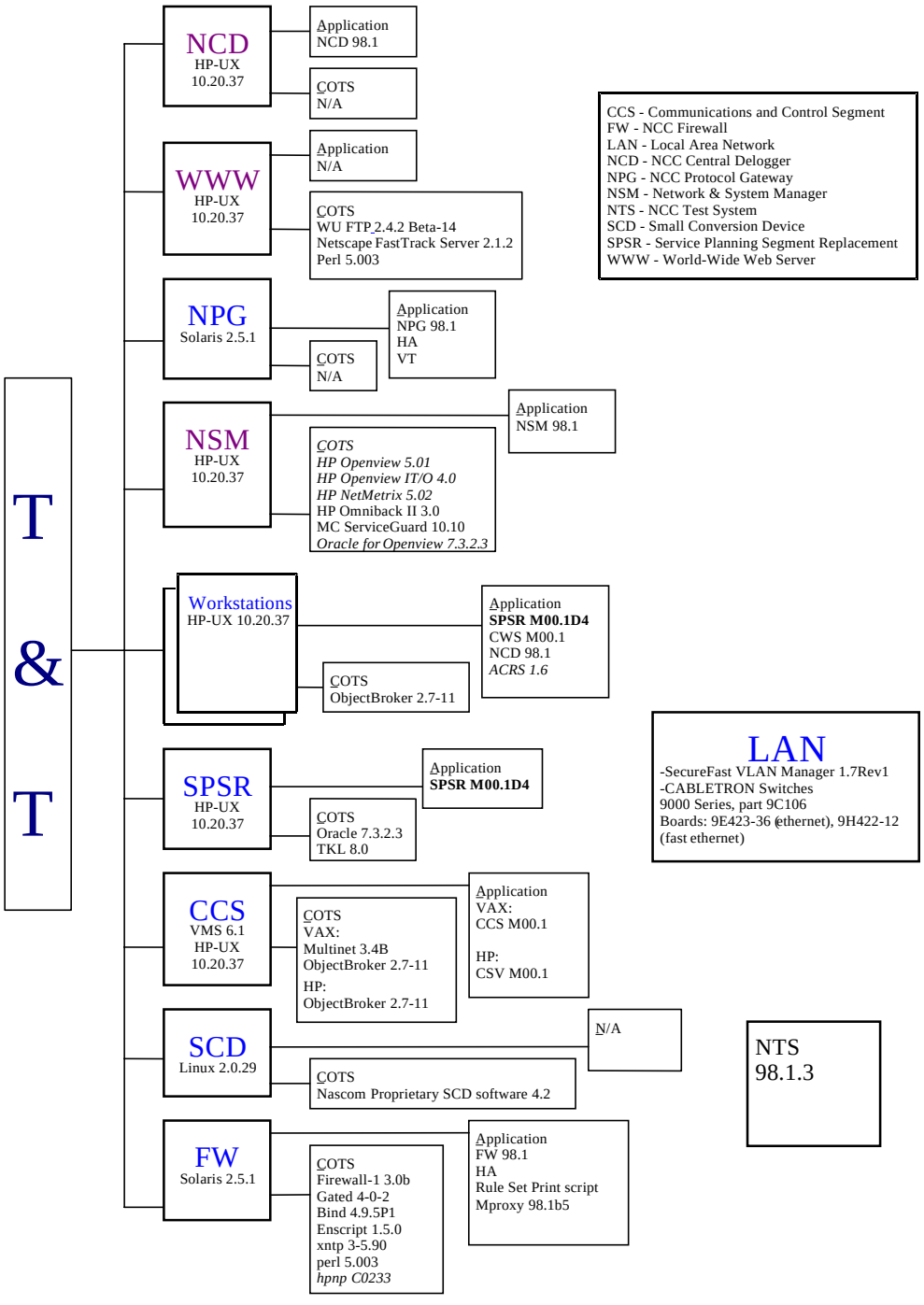


***Figure A-1 System Test Software Configuration for Release M00.1***

# Appendix B. System Test Items

**B.1**

This appendix contains a listing of all the System Test items executed during Release M00.1 system testing.

**B.2**

The status column records the final status of each test item: Passed (P) or Waived (W). In order for System Test to be considered complete, no test item could be in the Failed state. A test item was not Passed until all PRs written against the test objectives were resolved and verified. Because all PRs were not resolved during Release M00.1 testing, a test item was considered Waived if any PR remained open. The Waived status was not assigned until the open PRs were approved for conversion.

# System Test Items

| Test Item | Title | Priority | Start | Complete | Status | PRs |
|---|---|---|---|---|---|---|
| MR1-1.02 | Remove Add and Delete Buttons for MDM and HDRM | M | 12/8/99 | 1/7/00 | P | |
| MR1-1.03 | Batch Schedule Error Checking | H | 11/3/99 | 11/15/99 | W | 3399 |
| MR1-1.04 | Saving Changes To Return SSC Windows | M | 11/3/99 | 11/9/99 | P | 3377 |
| MR1-1.05 | Request ID/Event ID is Displayed Correctly | L | 11/5/99 | 11/8/99 | P | |
| MR1-1.06 | Validate Tracking SSCs Correctly | M | 12/7/99 | 12/7/99 | P | |
| MR1-1.07 | Use Labels in Filter that are Consistent with Window | L | 11/19/99 | 11/19/99 | P | |
| MR1-1.08 | Cannot Add a Return Channel when Editing a SAR | M | 12/10/99 | 12/14/99 | P | |
| MR1-1.09 | Active Schedule - Impact Indicators | M | 12/10/99 | 12/15/99 | P | |
| MR1-1.10 | Service Parameter Records Use Default Buttons | L | 11/5/99 | 11/5/99 | P | |
| MR1-1.11 | Deleting All Db Records for a Deleted SSC | M | 11/8/99 | 11/15/99 | P | |
| MR1-1.12 | Cannot Delete Destinatons from the Database During Transmissions | H | 11/2/99 | 11/4/99 | P | |
| MR1-1.13 | VTRS and STRS Windows Display Time of Next Execution | H | 10/25/99 | 10/27/99 | P | 3369 |
| MR1-1.14 | Remove Appropriate Edit Control Information | H | 10/26/99 | 10/26/99 | P | |
| MR1-1.15 | SMA Cross Support Forward Link | M | 11/8/99 | 11/12/99 | P | |
| MR1-1.16 | Dialog Box Appears when DbConsistency Error Occurs | M | 11/10/99 | 12/30/99 | P | 3398 |
| MR1-1.17 | VTRS Offset and Review Values Always Saved in Database | M | 11/3/99 | 11/4/99 | P | |

# System Test Items

| Test Item | Title | Priority | Start | Complete | Status | PRs |
|---|---|---|---|---|---|---|
| MR1-1.18 | Waitlisted Requests Cannot be Edited | M | 12/15/99 | 12/16/99 | P | |
| MR1-1.19 | AltSAR and Replace Request Priority | M | 12/13/99 | 12/14/99 | P | |
| MR1-1.21 | Multiple Events for the Same Request | H | 12/9/99 | 12/9/99 | P | |
| MR1-1.22 | Batch Schedule Process Request Event Filter | M | 12/22/99 | 12/22/99 | P | 3372, 3373, 3374, 33 |
| MR1-1.23 | Memory Leak and Roguewave Bug | M | 12/14/99 | 12/14/99 | P | |
| MR1-1.24 | Request ID/Event ID is Displayed Correctly in Wait List Window | L | 11/8/99 | 11/8/99 | P | |
| MR1-1.25 | Saving Replace Requests Without Changing The Window | M | 10/27/99 | 10/27/99 | P | |
| MR1-1.26 | Various GUI Layouts | L | 12/8/99 | 1/7/00 | P | |
| MR1-1.27 | Schedule Analysis Statistics | H | 10/14/99 | 1/20/00 | P | 3364, 3413 |
| MR1-1.28 | Separate Windows for Forward and Return EET SSCs | M | 11/12/99 | 1/10/00 | P | 3382 |
| MR1-1.29 | Deleting GTs, SGLTs, and TDRSs | M | 12/7/99 | 12/10/99 | P | |
| MR1-1.30 | Relative and Absolute Boundary Buttons | L | 1/3/00 | 1/21/00 | P | |
| MR1-1.31 | Events Sorted by Start Time in Schedule Editor | L | 12/27/99 | 12/27/99 | W | 3430 |
| MR1-1.32 | Incorrect Batch Schedule Status | M | 12/16/99 | 12/28/99 | P | |
| MR1-1.33 | Scheduling Windows | H | 11/11/99 | 11/12/99 | P | 3383 |
| MR1-1.34 | Reprocessing and the Request Pool Window | H | 11/16/99 | 12/19/99 | P | 3385 |
| MR1-1.35 | Automatic Importing of Primary Chain Members | H | 12/10/99 | 12/15/99 | P | |

# System Test Items

| Test Item | Title | Priority | Start | Complete | Status | PRs |
|---|---|---|---|---|---|---|
| MR1-1.36 | Request Pool Filter | M | 12/9/99 | 12/11/99 | P | 3425 |
| MR1-2.01 | Changes to Declined Requests when Referenced by a Replace Request | H | 12/1/99 | 12/28/99 | P | |
| MR1-2.02 | TDRS Unscheduled Time (TUT) - MAR | M | 12/21/99 | 12/22/99 | P | |
| MR1-2.03 | Batch Requests Expire when Batch Boundary is in the Past | H | 11/22/99 | 11/29/99 | P | |
| MR1-2.04 | Multiple Primary Versions of a Request | H | 11/24/99 | 11/30/99 | P | |
| MR1-2.05 | Obsolete Lock-Outs | H | 11/19/99 | 11/24/99 | P | |
| MR1-2.06 | Guard Locks | H | 11/19/99 | 11/24/99 | P | |
| MR1-2.07 | Delete Secondaries when Original is Waitlisted | H | 11/16/99 | 11/23/99 | P | |
| MR1-2.08 | Declined Explanation String Length | H | 10/15/99 | 10/27/99 | P | |
| MR1-2.09 | Deleting Secondary Versions of Declined Baseline Requests | M | 12/2/99 | 12/7/99 | P | |
| MR1-2.10 | Gap in EET Event | H | 10/19/99 | 10/19/99 | P | |
| MR1-2.11 | Secondary Alternate SARs with Incorrect Explanation | H | 10/25/99 | 10/26/99 | P | 3366, 3367 |
| MR1-2.12 | Fixed TUT When Flexibility is Used | M | 12/21/99 | 1/5/00 | P | |
| MR1-2.13 | Activeschedulebroker Hangs After Oracle Error #2201 | H | 12/6/99 | 1/14/00 | P | |
| MR1-2.14 | Displaying Minus Duration Tolerance for a Baseline Customer | M | 12/7/99 | 12/8/99 | P | |
| MR1-2.15 | Requests with Tracking Services and Flexibility | H | 11/30/99 | 12/20/99 | P | 3401 |
| MR1-2.16 | EET Events Supported after TDRS Mapping Change | H | 10/28/99 | 10/28/99 | P | |

# System Test Items

| Test Item | Title | Priority | Start | Complete | Status | PRs |
|---|---|---|---|---|---|---|
| MR1-2.17 | SRM Reporting for MA and SA Resource Limitations | H | 11/23/99 | 11/23/99 | P | 3408 |
| MR1-2.18 | Minimum Bandwidth is Allocated | H | 12/2/99 | 12/2/99 | P | |
| MR1-2.19 | Multiple TSW Updates Received 10 to 15 Milliseconds Apart | H | 11/5/99 | 12/2/99 | P | |
| MR1-2.20 | Process Playback Events in Batch Schedules | H | 10/29/99 | 11/1/99 | P | |
| MR1-2.21 | Batch Schedule Activation Audit for Omitted Requests | M | 12/13/99 | 12/14/99 | P | |
| MR1-2.22 | Removal of Deleted Events from Active Schedule Window | M | 12/29/99 | 1/7/00 | P | |
| MR1-3.01 | ShoStatusMonitor Signal Handling | H | 10/18/99 | 10/22/99 | P | |
| MR1-3.02 | Performing Request Validation at Request Save | M | 12/28/99 | 12/30/99 | W | 3434, 3435 |
| MR1-3.03 | SRM Reporting Upon Database Exceptions | H | 11/30/99 | 12/8/99 | P | 3409, 3410 |
| MR1-3.04 | CSN/SBSN Usage in Tracking Services is Not Constrained to Link References | H | 11/24/99 | 12/9/99 | P | |
| MR1-4.01 | Transmission Segmentation | M | 12/16/99 | 12/20/99 | P | |
| MR1-4.02 | Service Connection Semaphore Deadlock | H | 11/18/99 | 11/22/99 | P | |
| MR1-4.03 | Video UIFC is Included in 90/01 Message | H | 10/21/99 | 10/22/99 | P | |
| MR1-4.04 | Effects of TDRS Mappings on Schedule Transmissions | M | 12/21/99 | 12/21/99 | P | |
| MR1-5.01 | Transfer Maximum Number of Static Data Records to CCS | M | 12/21/99 | 1/5/00 | P | 3426, 2437 |
| MR1-5.02 | Display of TDRS ID on ODM Windows | M | 12/9/99 | 12/15/99 | P | |
| MR1-5.03 | Removal of Expired Events from CCS | M | 12/17/99 | 1/4/00 | P | |

# System Test Items

| Test Item | Title | Priority | Start | Complete | Status | PRs |
|---|---|---|---|---|---|---|
| MR1-5.04 | Increase Number of Spacecraft Transferrable to CCS | M | 12/21/99 | 12/21/99 | P | |
| MR1-5.05 | Amount of Time Between GCMR and OPM | M | 12/3/99 | 12/10/99 | P | |
| MR1-5.06 | Validate K-Band Subtype for Acq-Fail Messages | M | 11/18/99 | 11/19/99 | P | |
| MR1-5.07 | Selection of Primary and Secondary Vectors | M | 11/2/99 | 11/2/99 | P | |
| MR1-5.08 | Ongoing Events Restarted After CCS Cold Start | H | 10/28/99 | 12/16/99 | P | 3376, 3378, 3411 |
| MR1-6.01 | Backup and Deletion of Log Files | M | 12/16/99 | 1/20/00 | P | |

# Abbreviations and Acronyms

The following is list of terms and abbreviations found in this document and in other test-related documentation and reference documents.

| | |
|---|---|
| ACQ/TRK | acquisition/tracking |
| ACRS | automated conflict resolution system |
| AIS | automated information system |
| ATRR | acceptance test readiness review |
| ATSC | Allied Signal Technical Services Corporation |
| BVT | build verification test |
| CCB | configuration control board |
| CCR | configuration change request |
| CCS | communications and control segment |
| CDR | critical design review |
| CM | configuration management |
| cNMOS | consolidated Network and Mission Operations Support |
| COTS | commercial off the shelf |
| CSC | Computer Sciences Corporation |
| CSCI | computer software configuration item |
| CSS | Nascom Control and Status System |
| CTB | communication test block |
| CTM | communication test message |
| DB | database |
| DBA | database administrator |
| DFCD | data format control document |
| DG | data group |
| DIS | data interface system |
| DQM | data quality monitoring |
| DSID | data stream ID |

| | |
|---|---|
| DTS | daily test summary |
| EET | end-to-end test |
| EIF | engineering interface |
| FDF | Flight Dynamics Facility |
| FTP | file transfer protocol |
| FW | firewall |
| GCM | ground control message |
| GCMR | ground control message request |
| GSFC | Goddard Space Flight Center |
| GUI | graphical user interface |
| GT | ground terminal |
| HA | high availability |
| HDRM | high data rate multiplexer |
| I&A | identification and authentication |
| I&T | integration and test |
| I/O | input/output |
| ICD | interface control document |
| IFL | interfacility link |
| IIR | interface incidence report |
| IIRV | improved interrange vector |
| INPG | interim NCC protocol gateway |
| ITRR | integration test readiness review |
| JISTT | Joint Integration and System Test Team |
| JPIC | Joint Process Improvement Committee |
| JSC | Johnson Space Center |
| KaSA | Ka-band single access |
| KaSAF | Ka-band single access forward |
| KaSAR | Ka-band single access return |
| KuSA | Ku-band single access |
| KuSAF | Ku-band single access forward |

| | |
|---|---|
| KuSAR | Ku-band single access return |
| LAN | local area network |
| LI | local interface |
| MA | multiple access |
| MAF | multiple access forward |
| MAR | multiple access return |
| MDM | multiplexer/demultiplexer |
| MO&DSD | Mission Operations and Data Systems Directorate |
| MOC | Mission Operations Center |
| NASA | National Aeronautics and Space Administration |
| Nascom | NASA communications |
| NCC | Network Control Center |
| NCCDS | NCC Data System |
| NCC 98 | Network Control Center Data System 1998 |
| NCD | NCC Central Delogger |
| NCR | NCC change request |
| NSM | Network and System Manager |
| NES | Nascom event schedule |
| NFE | NCC front-end |
| NPG | NCC Protocol Gateway |
| NRR | Nascom reconfiguration request |
| NTS | Network Testing System |
| OCR | Operations Control Room |
| ODM | operations data message |
| OPM | operations message |
| PR | problem report |
| RID | review item disposition |
| RMA | reliability/maintainability/availability |
| RR | requirements review |
| SA | single access |

| | |
|---|---|
| SAR | schedule add request |
| SAS | service accounting segment |
| S/C | sensitivity/criticality |
| SCD | small conversion device |
| SDE | software development environment |
| SDF | software development facility |
| SDPF | Sensor Data Processing Facility |
| SGLT | space-to-ground link terminal |
| SHO | scheduled service order |
| SHO ID | scheduled service order identification |
| SIC | spacecraft identification code |
| SLR | service level report |
| SMA | enhanced multiple access |
| SMAF | enhanced multiple access forward |
| SMAR | enhanced multiple access return |
| SN | space network |
| SPSR | service planning segment replacement |
| SQL | structured query language |
| SRIS | system resources infrastructure segment |
| SRD | system requirements document |
| SRM | schedule result message |
| SRR | system requirements review |
| SSA | S-band single access |
| SSAF | S-band single access forward |
| SSAR | S-band single access return |
| SSC | service specification code |
| STDN | Spaceflight Tracking and Data Network |
| STGT | Second TDRSS Ground Terminal |
| STRR | System Test Readiness Review |

| | |
|---|---|
| STRS | schedule transmission rule set |
| SUPIDEN | support identification |
| SWO | security watch officer |
| T&T | Test and Training |
| TBD | to be determined |
| TBS | to be supplied |
| TCP/IP | transmission control protocol/internet protocol |
| TDRS | tracking and data relay satellite |
| TDRSS | Tracking and Data Relay Satellite System |
| TLAS | TDRS look angle system |
| TNC | TDRS Network Controller |
| TRR | test readiness review |
| TRS | transmission rule set |
| TSW | TDRS scheduling window |
| TT&C | tracking, telemetry and command |
| TUT | TDRSS Unscheduled Time |
| UPD | user performance data |
| User ID | user identification |
| USM | user schedule message |
| UTC | coordinated universal time |
| VIC | vehicle identification code |
| VID | vehicle ID |
| VT | vector translator |
| VTRS | vector transmission rule set |
| WSC | White Sands Complex |
| WSGTU | White Sands Ground Terminal Upgrade |
| WWW | World Wide Web |
| Y2K | Year 2000 |

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